IN THE CLAIMS

Please cancel claims 24-25, and amend claims 1, 11, 18, and 21 as follows:

1. (Currently amended) A free space optical communication system comprising:
   a fiber optic cable for carrying an optical signal;
   a combination optical amplifier coupled to said fiber optic cable and configured to amplify said optical signal;
   wherein said combination optical amplifier comprises at least:
      a first optical amplifier having a maximum gain at a first wavelength; and
      a second optical amplifier having a maximum gain at a second wavelength different from the first wavelength; and
   <u>wherein the first optical amplifier and the second optical amplifier each amplify said optical signal; and</u>
   a transmitter coupled to said combination optical amplifier and configured to transmit said amplified optical signal across a free space medium.

2. (Original) The free space optical communication system of claim 1, said transmitter further comprising: an adaptive optics system for modifying the phase of said amplified optical signal before transmitting said amplified optical signal across said free space medium.

3. (Original) The free space optical communication system of claim 2, wherein said adaptive optics system comprises:
   an active optical element having an adjustable tip, tilt, and piston position, said amplified optical signal is reflected from said active optical element before transmission across said free space medium; and
   a control module operable to control said adjustable tip, tilt, and piston position of said active optical element based on an atmospheric figure.

4. (Original) The communication system of claim 3, wherein said adaptive optics system further comprises a wavefront sensor configured to sense said atmospheric figure based on characteristics of the surrounding atmosphere.

5. (Original) The free space optical communication system of claim 4, further comprising a receiver for receiving said optical signal and transmitting to said control module said atmospheric figure.

6. (Previously presented) The free space optical communication system of claim 3 wherein said control module is coupled to said combination optical amplifier and is configured to control the magnitude of optical gain by said combination optical amplifier.

7. (Original) The free space optical communication system of claim 1, further comprising: a dense wavelength division multiplexing (DWDM) module coupled to said fiber optic cable and configured to receive a plurality of data signals and multiplex all of said plurality of data signals into said optical signal wherein each of said plurality of signals is transmitted at a different wavelength.

8. (Previously presented) The free space optical communication system of claim 1, wherein at least one of said first and second optical amplifiers is a Raman amplifier.

9. (Previously presented) The free space optical communication system of claim 1, wherein said combination optical amplifier is a combination of a Raman amplifier and an Erbium-doped amplifier.

10. (Previously presented) The free space optical communication system of claim 1, wherein at least one of said first and second optical amplifiers is a semiconductor amplifier.

11. (Currently amended) A free space optical communication system comprising:

a combination optical amplifier configured to amplify an optical signal;

wherein said combination optical amplifier comprises at least:

a first optical amplifier having a maximum gain at a first wavelength; and

a second optical amplifier having a maximum gain at a second wavelength different from the first wavelength; and

wherein the first optical amplifier and the second optical amplifier each amplify said optical signal; and

a transmitter coupled to said combination optical amplifier and configured to transmit said amplified optical signal across a free space medium, wherein said amplified optical signal is attenuated as it travels across said free space medium;

a receiver configured to receive said attenuated optical signal; and

a third optical amplifier configured to amplify said attenuated optical signal.

12. (Original) The free space optical communication system of claim 11 further comprising: an adiabatic taper apparatus coupled to said receiver and configured to reduce the diameter of said attenuated optical signal.

13. (Previously presented) The free space optical communication system of claim 12, wherein said adiabatic taper apparatus reduces the diameter of said amplified attenuated optical signal.

14. (Original) The free space optical communication system of claim 11 further comprising:

an active optical element having an adjustable tip, tilt, and piston position; and

said active optical element is configured to reflect said amplified optical signal before transmission across said free space medium.

15. (Original) The free space optical communication system of claim 14 wherein said active optical element is one or more of the following: microelectro-mechanical systems, liquid crystal arrays, piezo electric mirrors, and deformable mirrors.

16. (Previously presented) The free space optical communication system of claim 11, further comprising:

a dense wavelength division multiplexing (DWDM) module coupled to said combination optical amplifier and configured to receive a plurality of data signals and multiplex all of said plurality of data signals into said optical signal before amplification by said combination optical amplifier, wherein each of said plurality of signals is transmitted at an orthogonal wavelength.

17. (Previously presented) The free space optical communication system of claim 16, further comprising: a dense wavelength division de-multiplexing (DWDDM) module coupled to said third optical amplifier and configured to receive and de-multiplex said amplified attenuated optical signal into said plurality of data signals.

18. (Currently amended) A free space optical communication system comprising:

a combination optical amplifier configured to amplify an optical signal;

wherein said combination optical amplifier comprises at least:

a first optical amplifier having a maximum gain at a first wavelength; and

a second optical amplifier having a maximum gain at a second wavelength different from the first wavelength; and

wherein the first optical amplifier and the second optical amplifier each amplify said optical signal; and

an active optical element with an adjustable tip, tilt, and piston position;

a control module configured to control said tip, tilt, and piston position of said active optical element;

said control module comprises a transmit probe for transmitting a test optical signal and a receive probe for analyzing said test optical signal in a free space medium, said control module determines said tip, tilt, and piston position based on the analysis by said receive probe; and

a transmitter configured to transmit said amplified optical signal towards said active optical element so that said amplified optical signal reflected from

said active optical element is modified according to said analysis by said receive probe.

19. (Original) The free space optical communication system of claim 18 wherein said receive probe is configured to determine a phase angle of said test optical signal and said tip, tilt, and piston position of said active optical element are adjusted so that said reflected optical signal is 180° out of phase from said phase angle of said test optical signal.

20. (Original) The free space optical communication system of claim 19 wherein said active optical element is one or more of the following: microelectro-mechanical systems, liquid crystal arrays, piezo electric mirrors, and deformable mirrors.

21. (Currently amended) A free space optical communication system comprising:

a fiber optic cable for carrying an optical signal;

~~a dense wavelength division multiplexing (DWDM) module~~ a first optical amplifier coupled to said fiber optic cable and configured to amplify said optical signal ~~receive a plurality of data signals and multiplex all of said plurality of data signals into said optical signal, wherein each of said plurality of signals is transmitted at an orthogonal wavelength, said orthogonal wavelengths being in the near IR range;~~

~~a semiconductor optical amplifier coupled to said DWDM module and configured to amplify said optical signal; and~~

a transmitter coupled to said ~~semiconductor~~ first optical amplifier and configured to transmit said amplified optical signal across a free space medium, wherein said amplified optical signal is attenuated as it travels across said free space medium;

a receiver configured to receive said attenuated optical signal; and

a second optical amplifier configured to amplify said attenuated optical signal;

wherein said second optical amplifier comprises at least:

a third optical amplifier having a maximum gain at a first wavelength; and

a fourth optical amplifier having a maximum gain at a second wavelength different from the first wavelength; and

wherein the third optical amplifier and the fourth optical amplifier each amplify said attenuated optical signal.

22. (Original) The free space optical communication system of claim 21, said transmitter further comprising: an adaptive optics system for modifying the phase of said amplified optical signal before transmitting said amplified optical signal across said free space medium.

23. (Original) The free space optical communication system of claim 22, wherein said adaptive optics system comprises:

an active optical element having an adjustable tip, tilt, and piston position, said amplified optical signal is reflected from said active optical element before transmission across said free space medium; and

a control module operable to control said adjustable tip, tilt, and piston position of said active optical element based on an atmospheric figure.

24. (Canceled)

25. (Canceled)